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Online course for Intellectual Property Education

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Abstract

Intellectual property (IP) education is one of the core areas in the undergraduate curriculum of City University of Hong Kong which focuses on nurturing students' creativity and innovation. This paper describes an online course at CityU which introduces students to the basic concepts of IP and informs them of the importance of IP for their university study and future career. The course consists of 7 modules, covering different types of IP, values of IP for students, and some important issues which students may come across in their study and future career. Modules are designed to present concepts mainly through animations, each lasts less than 10 minutes, with a minimal amount of text. After each module, there is a quiz with 5 scenario questions randomly drawn from a pool of 15 questions. All questions require students to apply the concepts learned from the module to a practical context to demonstrate their understanding. The course was launched in September 2018 and since then 95 students enrolled. Among them, 23 completed all 7 modules or completed some of them. This paper investigates student pattern of access to the online modules. Preliminary results showed that students viewed the module "IP & Student" more frequently and viewed the module "Copyright" less frequently. However, they made more attempts on the quizzes of the modules "IP & Student", "Patent" and "Software" than the other modules and got lower scores in the modules "Patent" and "Software". In particular, students had difficulties answering the questions related to determining IP ownership and patentability of computer program. This suggests that these 2 topics should be emphasized in the future IP education.

Keywords: Online course, e-learning, intellectual property education

Introduction

In modern knowledge-based economy, intellectual property (IP) is a critical form of intangible business assets that fosters innovation and catalyzes economic development. Nowadays, learning IP is no longer limited to law students but also to students from business school, engineering school, science school as well as students from school of art and humanities and social sciences. Indeed, students across different disciplines need to be familiar with IP, to understand its potential impact to economic growth and to respect IP rights, whether those of others or their own (Allman, Sinjela, & Takagi, 2008). City University of Hong Kong offers an IP online course tailored to meet such basic needs.

City University of Hong Kong has incorporated discovery and innovation into the curricula of all undergraduate and taught postgraduate programs (Liu, Chim, Chung, & Ho, 2012; Pascoe, 2017). Under this curriculum, students are deemed to be knowledge creators and are engaged to discover new knowledge and create innovative ideas in authentic context (Chan & Shek, 2018; Chiu, 2016). Equipping students with basic knowledge of IP is one of the core areas in CityU's professional education. Therefore, Office of Education Development and Gateway Education (EDGE), as the central office

providing supports on teaching and learning for staff and students, developed and offered an online course for all students. The course aims to introduce students with the basic concepts of IP, the basic understanding of the role of IP in modern society and the importance of IP in their present university study and future career. Therefore, the course covers not only different types of IP but also the values of IP in modern business world, how to avoid infringement and take actions against infringement, how to protect IP rights properly, how to handle IP issues in workplace and study. The course consists of 7 modules, namely:

1. IP & Student
2. Economy of IP
3. Copyright
4. Patent
5. Software
6. Industrial Design
7. Trademark and Brand

Each module possesses 1 video clip followed by a quiz. Each video clip presents the topic and concepts in the form of animation with duration of no more than 10 minutes and with minimal amount of text. Each quiz consists of 5 questions drawn randomly from a pool of 15-20 questions related to the module. Students are required to analyze and evaluate the scenario presented in the question and apply the concepts presented in the module. The course was launched in the first semester of 2018/19 academic year. In the first semester, there were 101 enrollments and 23 students have completed all modules or completed some of them.

Since the content of this online course is in very general manner, the objectives of this paper are to explore student's learning outcomes of each module and to find out which topic should be emphasized in other relevant courses or workshops. In particularly, this study aims to address the following questions:

1. What IP topics would students pay more attention to?
2. What IP areas might students have difficulty?

Methodology

The online course was housed on Canvas site internally at City University of Hong Kong and allows all students, including undergraduate, taught postgraduate and research students to enroll. In total, 101 students enrolled the course in the semester A of academic year 2018/19. Their activities on the course Canvas site were recorded and retrieved for analyzing students' learning behavior, such as number of times they watched each video and number of attempts for each quiz. Scores of each individual attempt for each quiz were recorded and average score for each quiz was calculated. Rate of correct answer for each individual question was also recorded.

Findings

Among 101 enrolled students, 23 of them completed all 7 modules or some of the modules. Around two-third of them were undergraduate, mainly year 1 and year 3 students. Details of their academic background are summarized in table 1.

Figure 1 below shows the average number of views of each video of individual module. Students watched most frequently the video of "IP and Student" modules, in average 3.0 ± 2.0 views per students while the video of "Copyright" modules was watched least frequently, in average 1.4 ± 0.6 views per students (Figure 1). The views of modules related to 5 types of IP were more or less the same, ranging from 1.4 to 1.9 views per

student. T-test revealed that the differences in video views among the 5 IP types were not statistically significant ($p>0.05$). However, the views of the module "IP and Student" and "Economy of IP" were significantly higher ($p<0.05$) than the view of "Copyright", indicating that students are more interested to how IP is related to them, rather than knowing IP. We speculated that students might perceive that they had learned more about IP because IP education is included in all levels of education in Hong Kong even though the focus is more related to plagiarism and copyright protection (OHIM, 2015).

Table 1
Percentage Distribution of Sample

Profile Factors	Particulars	No. of students	%
Level of study	Undergraduate	15	65.22
	Postgraduate	8	34.78
College/School	College of Business	4	17.39
	College of Liberal Art and Social Sciences	4	17.39
	College of Sciences and Engineering	8	34.78
	School of Energy and Environment	2	8.70
	School of Law	5	21.74
Year of study (only undergraduate)	1	6	40.00
	2	2	13.33
	3	5	33.33
	4	2	13.33

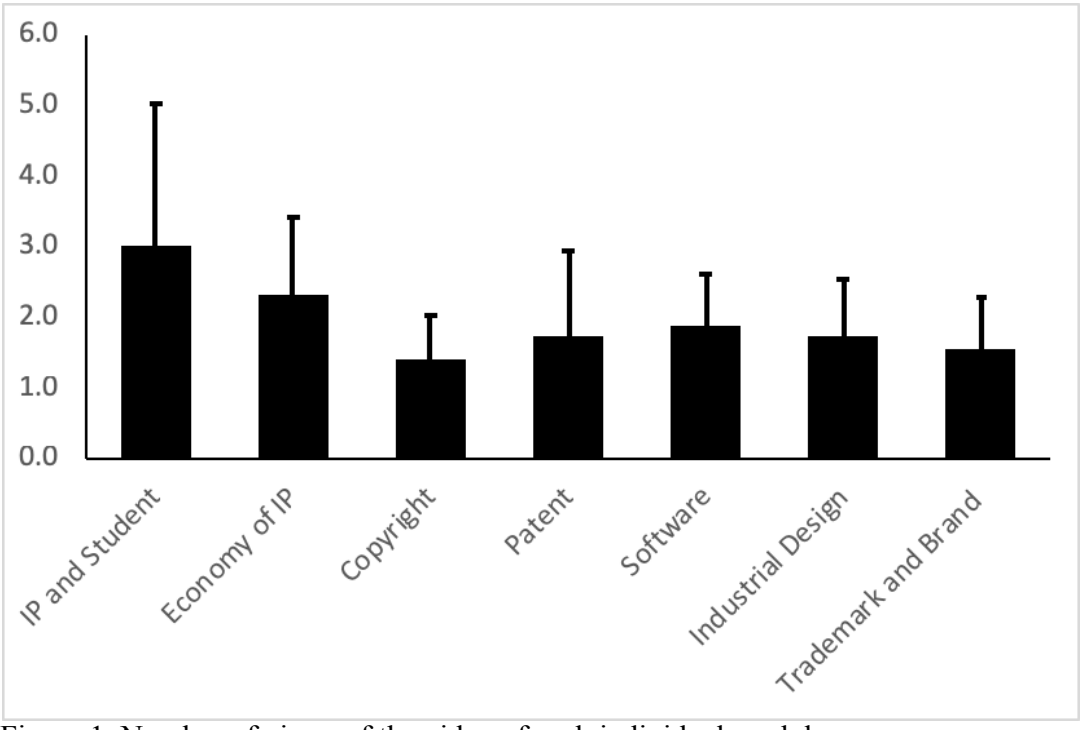

Figure 1. Number of views of the video of each individual module

Similar to the pattern of watching video clips of "IP and Student", students also attempted the quiz for "IP and Student" most frequent. However, students attempted the

quiz for "Economy of IP" in average 1.5 times, the least one among the 7 modules. Instead, students attempted the quizzes for "Patent" and "Software" more frequently than the other 4 modules. In average, students had 3.2 attempts for "Software" and 3 attempts for "Patent". Nevertheless, students got least scores in these 2 quizzes, 71.03 and 71.77 for "Software" and "Patent" respectively. This is expected because both patent and software-related IP are highly affected by the advancement of computer technology and students may not have gained enough knowledge from their learning experiences.

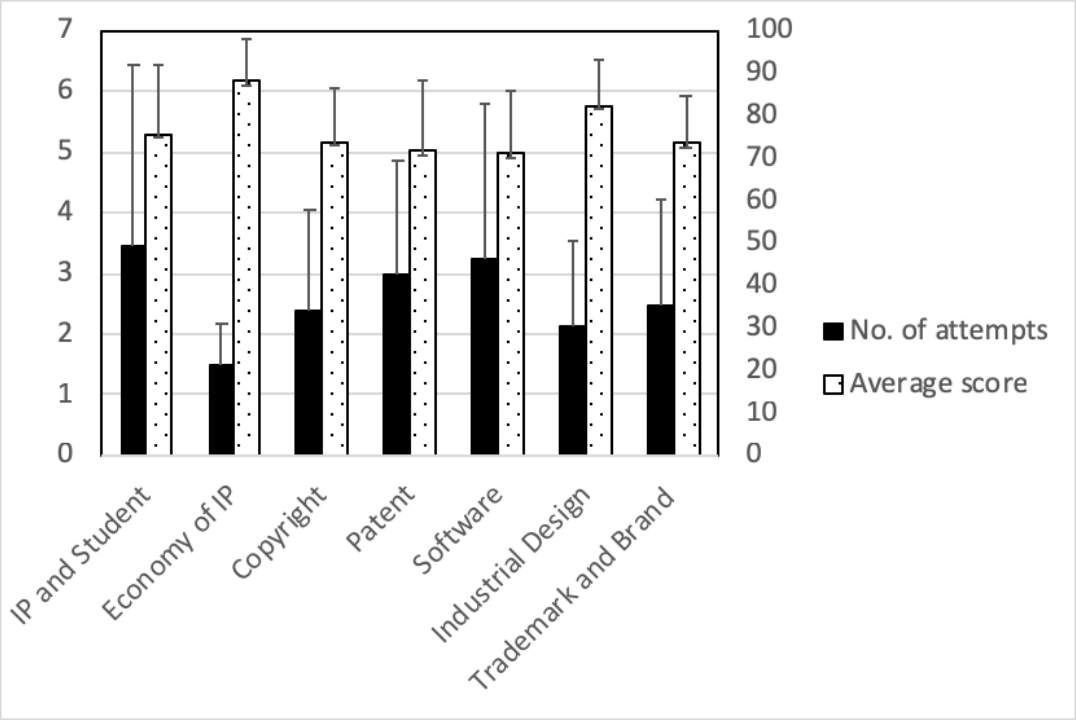

Figure 2. Number of attempts on the quiz of each module and the average score got.

In order to investigate what type of questions students found most difficult, we further analyzed the answers students submitted. We found that students have difficulties to answer questions related to determining IP ownership. For example, when students were asked to determine who owned the IP right of an invention if the invention was developed jointly by a research assistant and an undergraduate student who voluntarily work in that research group, 20 out of 22 attempts were wrong. Majority of them (60%) answered either "jointly owned by the research assistant and the undergraduate" or "solely by the research assistant". The correct answer should be "jointly owned by the undergraduate and the university". It required students to have a correct understanding that employer will have rights over the invention which was created by the research assistant during his/her working time within the university (WIPO, 2019). Another topic that students found difficult was related to software-related invention. For example, students were asked to determine whether it was infringement if a person developed software that performed functions exactly the same as another software which was patent-protected. To answer this question, students had to correctly compare patent-protected and non-patent protected software invention and evaluate the scenario. Only 7 out of 18 attempts were correct.

Discussion

Educating students the basic knowledge and importance of IP is essential for preparing future workforce in 21st Century. In order to enhance students' awareness on IP issues, we offered an online course for all students in City University of Hong Kong. Since IP is fragmentary and complex in nature, it is difficult to design a course covering all aspects of IP in details for all students from different academic disciplines. Therefore, we took the approach as Srivastava suggested (Srivastava, 2013) that course content should have a comprehensive coverage of all aspects of IP without providing in depth details. It would be unnecessary to burden students with specific IP topics, such as patent law, and reduce their learning interest. Nevertheless, students may obtain specialized knowledge of IP from their future study.

Our results showed that students spent more time on the module to explore the meaning of IP related to themselves, probably because students wanted to know more about how IP was important for their study and future career. This was similar to student learning attitude toward intellectual property found by a survey conducted in UK (NUS, 2013). Their survey also found that once students were exposed to some aspects of IP, they felt more confident about it and wanted to know more. Our results also identified what topics students need to know more and should be incorporated in other courses. The extent of IP education should not stop at course but also include final year project or other undergraduate research opportunities. Final year project and undergraduate research can provide students valuable learning experience to nurture problem-solving and critical thinking skills but also create potential legal problem related to IP rights (Nordheden & Hoeflich, 1999). Therefore, emphasis of university IP policy and ownership issues should be incorporated into final year project and undergraduate research program. In addition, in this digital era, technology has become readily available for everyone to access information and idea around the world. Students can create their software or mobile app easier than before. However, our results indicated that students were not well informed about the software-related invention, probably because the field of patentability of software-related invention keeps changing and litigation results may be different in different jurisdictions. Therefore, this is another topic that needs to be incorporated into future undergraduate courses, not only limited to computer sciences and computer engineering students but also includes business school students.

Limitation of this study is that data only came from a small sample group of students that took this online course. This limitation could be overcome in the future when more students complete the course. In addition, future study could include an experimental design to test for the impact of this online course on student learning achievements, in terms of intellectual property, innovation and entrepreneurship, in relevant courses by comparing students who took this online course with students who did not.

Conclusion

In conclusion, since the world is changing from industrial-based economy to knowledge based economy, increasing value is being placed on IP rights. Therefore, as educational institution prepare workforce for future, nurturing students with knowledge of IP is of important. This study indicates what topics students are more interested in and what topics should be incorporated in their future learning. Our preliminary results on the data of semester A of 2018/19 academic year showed that students would pay more attention to how IP relates to them, probably because the meaning of learning IP is important for them. Moreover, the quiz scores revealed that students might not understand well about all IP types, particularly patent and software-related invention. In particular, students might not be able to determine ownership of IP rights and debatable but

complicated type of software-related invention. Therefore, these 2 areas, ie. ownership determination and patent/software invention should be emphasized in the future IP education in City University of Hong Kong.

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